

Trend Study 11B-1-05

Study site name: Deadman.

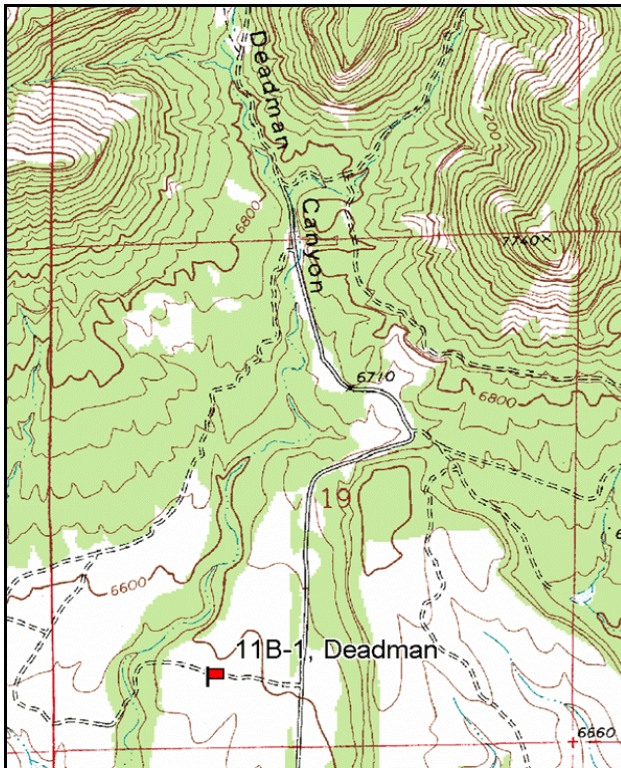
Vegetation type: Chained, Seeded P-J.

Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 1 rebar @ 1ft and belt 3 rebar @ 10 ft.

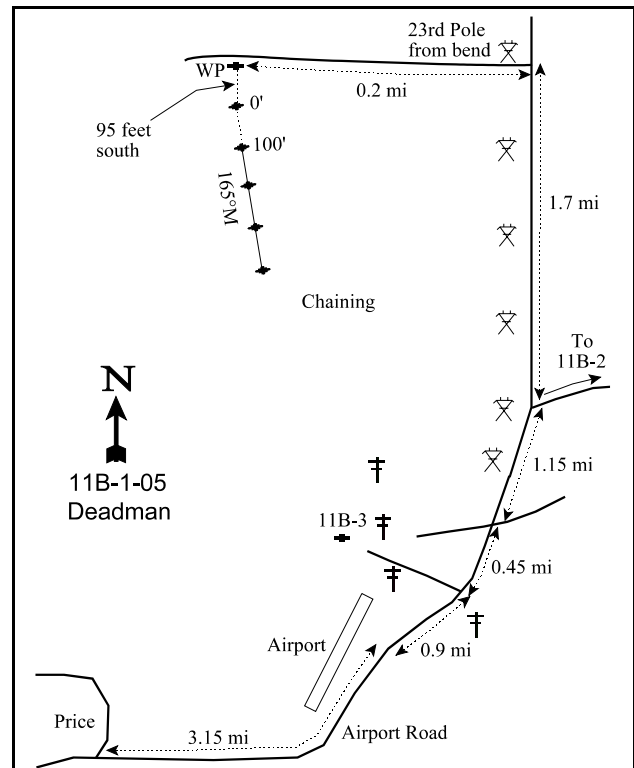
LOCATION DESCRIPTION

From the southeast end of Price, take the Airport Road east 3.15 miles to the airport. Continue 0.9 miles to a power line (and a left turn to the Airport transect). Proceed 0.45 miles to an intersection. Stay left on the main road for 1.15 miles to a corral and a fork to the right which leads to the Airport Bench transect. There is a bend in the power line on the left. Stay left and proceed up the main road another 1.7 miles (to the 23rd pole from the bend in the power line) and turn left. Proceed 0.2 miles, passing power pole #365, to a witness post (a green fence post with browse tag #7854) on the left side of the road in a chaining. The transect starts 95 feet south of the witness post. The transect is marked by rebar stakes, 1 to 2 ½ feet in height.



Map Name: Deadman Canyon

Township 13S, Range 11E, Section 19



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4391637 N, 522924 E

DISCUSSION

Deadman - Trend Study No. 11B-1

Located near the mouth of Deadman Canyon, the Deadman trend study samples winter range on the bench lands northeast of Price and south of the Book Cliffs. Much of the area (managed by the BLM Price River Resource Area) was chained and seeded in 1965-66. Since the treatment, young surviving pinyon and juniper trees have resumed dominance of the area. Wood cutting (chained wood only) and Christmas tree cutting is allowed on the chained area. The site elevation is 6,600 feet with a slope of 3-4% on a southern exposure. The study is near Deadman Creek, which only contains water seasonally. It drains south into the Price River. Human activity is high with numerous roads making the area very accessible. There is also activity associated with the coal mines located farther up the canyon. This area lies within the Coal Creek allotment which is grazed by cattle from mid-April to the end of May and again during the month of October. Wildlife use appears to have declined since 1994. Quadrat frequency of deer and rabbit pellet groups were high in 1994 at 42% for deer and 44% for rabbit, then dropped dramatically in 2000 to 23% for rabbit and 15% for deer. A pellet group transect read on site in 2000 provided an estimate of only 19 deer use days/acre (47 ddu/ha). In 2005, the estimated pellet group data estimated 60 deer and 2 cow days use/acre (149 ddu/ha and 4 cdu/ha).

Soil texture is a sandy loam with a mildly alkaline pH of 7.5. The soil appears moderately deep overall with an effective rooting depth estimated at almost 15 inches. Rock and pavement are common on the surface and within the profile with most of the rock concentrated in the upper 8 inches. Much of the rock contains a calcium carbonate coating and some areas have developed a weak hardpan at a depth of about 12 inches. There is also some exposed sandstone bedrock in the area. There is a fair amount of litter protecting the soil surface, much of it is large persistent litter from the chaining. However, there are large areas of bare soil in the shrub and tree interspaces. Erosion does not appear to be a problem, even with large amounts of bare soil. Phosphorus could be a limiting factor at only 4.3 ppm, values less than 6 ppm may limit normal plant growth and development in wildland soils (Tiedemann and Lopez 2004). The erosion condition class determined soil movement as stable in 2005.

The most abundant key browse species is true mountain mahogany. Mahogany cover was 1% in 1994 and 2% in 2000 with an estimated density of 100 plants/acre in both 1994 and 2000. In 2005, mahogany cover was only 1% with an estimated density of 80 plants/acre. These plants have spread naturally into the area. The majority of the mountain mahogany encountered were vigorous mature plants that showed only light to moderate use in 1986 and 1994. However, use was heavy on 60% of the plants sampled in 2000 and 100% of the plants in 2005. In past studies, the tallest portions of these plants were growing out of reach of browsing animals, allowing their bushy growth habit provides good amounts of available forage, but in 2005 the plants averaged less than 4 feet in height. Important browse species that were seeded when the area was chained, include fourwing saltbush and bitterbrush. Individuals of these species are widely scattered and are mostly older plants. They do not appear to be reproducing although the plants are vigorous and putting on good growth. A few mountain big sagebrush occur in the area and the first plants sampled in density measurements occurred in 2005 with an estimated 20 young plants/acre. Green ephedra has been vigorous with an estimated density of 160 plants/acre in 2000 and 320 plants/acre in 2005. Use was very heavy in 2000 with 75% of the plants sampled showing heavy use, but this decreased to 87% showing light use in 2005.

Broom snakeweed is the most abundant shrub on the site with a density that has increased from zero in 1986 to 760 plants/acre in 1994, and 9,380 plants/acre by 2000. By 2005, the snakeweed population had decreased to 520 plants/acre. Before the 2005 study, most of the population (87%) was mature, but young plants were common with the potential for population increase. In 2005, only 4% of the population was mature and 92% was young. This 94% decline in population was likely a product of drought and the increasing pinyon and juniper cover. Pinyon and juniper have dominated the overstory by providing combined cover of 8% in 1994, 12% in 2000, and over 27% in 2005. As pinyon and juniper cover increases, the understory cover decreases

(Tausch and West 1994). There has been evidence of light browsing of juniper. Both the juniper and pinyon appear to be resuming their dominance of the site. Point-quarter data from 2000 estimated 104 pinyon and 183 juniper trees/acre with an average diameter of 3.6 and 2.1 inches, respectively. Point-quarter data from 2005 estimated 118 pinyon and 213 juniper trees/acre with an average diameter of 5.4 and 4.3 inches, respectively. Nearly all of the pinyon and juniper appear to have been released by the chaining. This area needs to be retreated to reduce the pinyon-juniper competition. Pinyon and juniper trees may still small enough to be treated by a roller-chopper.

The seeding of crested wheatgrass established a fair stand, but began declining between 2000 and 2005. In 1986 crested wheatgrass was sampled in 97% of the quadrats, but was only found in 16% of the quadrats in 2005. Plants are scattered in small patches, are small in stature, and only provided 5% cover in 1994, 4% in 2000, and <1% in 2005.

A wide variety of forbs are found on the site, although none provide significant forage. All forbs combined, on average provide less than 3% cover. Seeded alfalfa was encountered in 8 quadrats in 1986 ,but significantly declined in nested frequency by 1994. It was not sampled in 2000 and 2005, and apparently died due to the extended drought and increased competition of pinyon and juniper trees. The pinyon-juniper cover has begun to inhibit growth of the understory species.

1986 APPARENT TREND ASSESSMENT

In terms of providing important winter forage for deer, this area appears to have an overall downward trend as pinyon and juniper increase in size. Much of the mountain mahogany has become unavailable due to height. Browse reproduction and variety are encouraging signs for this site to become good winter range. Management should strive to maintain the mountain mahogany and other browse species. Continued removal of the increasing pinyon-juniper with firewood and Christmas tree harvest is desirable. The soil is in good condition and trend appears stable.

1994 TREND ASSESSMENT

With the continuing drought, trend for soil is down with the increase in percent bare ground, a decrease in litter cover, and a significant decrease in crested wheatgrass. Key browse species are in low numbers, with the increaser broom snakeweed the most numerous shrub. However, the browse trend is stable. Trend for the herbaceous understory is downward as the majority of the cover is contributed by crested wheatgrass which has decreased significantly in nested frequency since 1986. The Desirable Components Index score was poor due to very low browse cover and only moderate to poor perennial grass and forb cover.

TREND ASSESSMENT

soil - down (-2)

browse - stable (0)

herbaceous understory - down (-2)

winter range condition (DC Index) - Poor (16) Lower Potential scale

2000 TREND ASSESSMENT

Trend for soil appears stable. Percent cover of bare ground increased slightly, but the ratio of bare soil to protective cover is almost unchanged. Relative cover of vegetation, litter and bare ground have remained similar between readings. There is some erosion occurring but it is minimized by the gentle terrain. Herbaceous vegetation is not abundant but sum of nested frequency for perennial grasses has remained similar to 1994. Trend for browse is down. Use of the preferred browse species, mountain mahogany, rubber rabbitbrush, and green ephedra is extremely high. In addition, percent decadency and plants with poor vigor

has increased for rubber rabbitbrush and green ephedra, and density of the increaser broom snakeweed has exploded from 760 plants/acre in 1994 to 9,380 in 2000. Pinyon and juniper trees are also increasing in size and density. Point-quarter data from 2000 estimate 104 pinyon and 183 juniper trees/acre with an average diameter of 3.6 and 2.1 inches, respectively. Nearly all of the pinyon and juniper trees appear to have been released by the chaining since only 5% of the trees sampled were surviving chained trees. These trees currently account for 55% of the total vegetation cover and produce 12% overhead canopy cover. Key browse species are low in number and without some sort of retreatment of the site to control pinyon and juniper, this area will no longer contain enough useful browse forage to be considered an important winter range. Trend for perennial grasses appears stable with similar sum of nested frequency values compared to 1994. Sum of nested frequency of perennial forbs has declined slightly but forbs were never very abundant. Overall, the herbaceous trend is considered stable but in poor condition. Herbaceous forage is limited with grasses and forbs combining to produce only 6% cover. The DCI score continued to be poor.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - stable (0)

winter range condition (DC Index) - Poor (15) Lower Potential scale

2005 TREND ASSESSMENT

The trend for soil is stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has not changed from 2000 to 2005. The browse trend is slightly down. From 2000 to 2005, pinyon and juniper increased in cover from 13% to 16%. The combined canopy cover of pinyon and juniper increased from 12% in 2000 to 27% in 2005. This increase in pinyon-juniper cover has caused a steady decrease in the already low cover for understory species, both herbaceous and browse. Mahogany density decreased with all of the population shifting from mature to decadent individuals. The average height and crown width decreased over a foot from 2000 to 2005. This is likely due to an increase in use from 60% heavy use in 2000 to 100% in 2005. Rubber rabbitbrush density also declined. The ephedra population increased from 160 to 320 plants/acre from 2000 to 2005, a 50% increase. As well, the percentage of mature individuals increased from 63% to 81% of the population and the percentage of decadent individuals decreased from 25 to 13%. The herbaceous understory trend is down. The perennial grass nested frequency decreased 81% from 2000 to 2005. The perennial forb nested frequency increased 55%, but the loss of perennial grasses is greater than the gain of perennial forbs. Besides, perennial grasses are of greater importance on winter range. The DCI score decreased to very poor due to decreases in browse and perennial grass covers.

TREND ASSESSMENT

soil - stable (0)

browse - slightly down (-1)

herbaceous understory - down (-2)

winter range condition (DC Index) - Very Poor (8) Lower Potential scale

HERBACEOUS TRENDS --
Management unit 11B, Study no: 1

Type	Species	Nested Frequency				Average Cover %		
		'86	'94	'00	'05	'94	'00	'05
G	Agropyron cristatum	c292	b223	b237	a37	5.12	4.13	.13
G	Aristida purpurea	-	4	1	-	.03	.15	-
G	Bouteloua gracilis	-	-	-	1	-	-	.00
G	Oryzopsis hymenoides	8	8	10	8	.08	.08	.01
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		300	235	248	46	5.24	4.36	0.15
Total for Grasses		300	235	248	46	5.24	4.36	0.15
F	Arabis perennans	b16	a-	a-	a-	-	-	-
F	Astragalus convallarius	5	-	1	-	.00	.00	-
F	Chenopodium fremontii (a)	-	a2	a-	b86	.00	-	.27
F	Cryptantha fulvocanescens	a43	a44	ab51	b72	.58	1.02	.58
F	Descurainia pinnata (a)	-	a5	a-	b21	.01	-	.28
F	Eriogonum alatum	-	-	4	-	-	.01	.00
F	Eriogonum cernuum (a)	-	a-	a-	b104	-	-	.43
F	Eriogonum umbellatum	19	16	15	9	.09	.13	.04
F	Euphorbia fendleri	b80	a24	a30	a14	.07	.11	.03
F	Gilia sp. (a)	-	-	-	3	-	-	.00
F	Hedysarum boreale	5	-	-	-	-	-	-
F	Ipomopsis aggregata	3	8	-	8	.01	-	.07
F	Lappula occidentalis (a)	-	-	-	1	-	-	.00
F	Lesquerella ludoviciana	a-	b21	a2	a3	.10	.00	.03
F	Lithospermum multiflorum	2	2	-	1	.01	-	.03
F	Machaeranthera canescens	a-	b20	a1	a3	.12	.00	.04
F	Machaeranthera grindelioides	4	5	-	-	.01	-	-
F	Medicago sativa	b18	ab5	a-	a-	.04	-	-
F	Penstemon caespitosus	-	3	-	-	.01	-	-
F	Penstemon cyanocaulis	a31	a27	a14	b96	.16	.09	1.51
F	Salsola iberica (a)	-	c77	b-	b16	.82	-	.04
F	Sphaeralcea coccinea	a5	b20	ab15	b19	.11	.22	.03
F	Townsendia incana	b14	ab7	ab12	a-	.01	.03	-
Total for Annual Forbs		0	84	0	231	0.84	0	1.03
Total for Perennial Forbs		245	202	145	225	1.36	1.64	2.40
Total for Forbs		245	286	145	456	2.21	1.64	3.43

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 11B, Study no: 1

Type	Species	Strip Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
B	Artemisia tridentata vaseyana	0	0	1	-	-	.00
B	Cercocarpus montanus	5	5	3	1.46	2.04	1.37
B	Chrysothamnus nauseosus hololeucus	5	7	4	.00	.38	.03
B	Ephedra viridis	4	6	6	.03	.18	.30
B	Gutierrezia sarothrae	14	57	17	.45	1.75	.03
B	Juniperus osteosperma	0	12	12	3.27	5.59	6.90
B	Opuntia sp.	5	5	3	.00	.03	.06
B	Pinus edulis	0	8	7	4.42	7.23	9.59
B	Purshia tridentata	2	1	0	.38	.03	-
Total for Browse		35	101	53	10.03	17.25	18.29

CANOPY COVER, LINE INTERCEPT --

Management unit 11B, Study no: 1

Species	Percent Cover	
	'00	'05
Cercocarpus montanus	-	.70
Chrysothamnus nauseosus hololeucus	-	.03
Ephedra viridis	-	.93
Gutierrezia sarothrae	-	.10
Juniperus osteosperma	5.00	9.36
Pinus edulis	6.59	17.73

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 11B, Study no: 1

Species	Average leader growth (in)
	'05
Cercocarpus montanus	0.5

POINT-QUARTER TREE DATA --
Management unit 11B, Study no: 1

Species	Trees per Acre		Average diameter (in)	
	'00	'05	'00	'05
Juniperus osteosperma	184	213	2.1	4.3
Pinus edulis	105	118	3.6	5.4

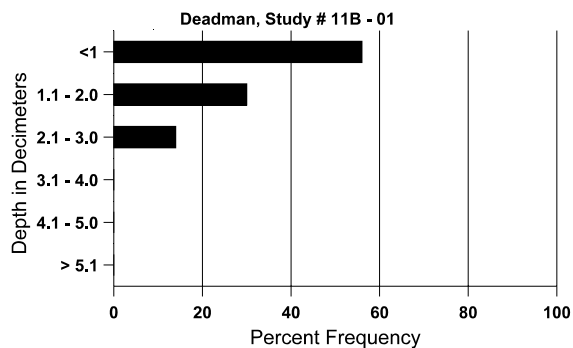
BASIC COVER --
Management unit 11B, Study no: 1

Cover Type	Average Cover %			
	'86	'94	'00	'05
Vegetation	6.25	17.24	25.72	20.64
Rock	2.25	8.81	9.61	8.77
Pavement	10.00	4.03	9.95	8.51
Litter	58.25	30.11	34.09	36.68
Cryptogams	0	.18	.13	.53
Bare Ground	23.25	29.17	37.48	41.76

SOIL ANALYSIS DATA --
Herd Unit 11B, Study # 1, Study Name: Deadman

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
14.9	52.4 (14.1)	7.5	57.3	24.7	18.0	2.6	4.3	70.4	0.8

Stoniness Index



PELLET GROUP DATA --

Management unit 11B, Study no: 1

Type	Quadrat Frequency			Days use per acre (ha)	
	'94	'00	'05	'00	'05
Sheep	-	1	-	-	-
Rabbit	44	23	49	-	-
Elk	5	-	-	-	-
Deer	42	15	23	19 (47)	60 (149)
Cattle	-	2	-	3 (7)	2 (4)

BROWSE CHARACTERISTICS --

Management unit 11B, Study no: 1

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata vaseyana</i>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
94	0	-	-	-	-	-	0	0	-	-	0	6/5
00	0	-	-	-	-	-	0	0	-	-	0	29/62
05	20	20	20	-	-	-	0	0	-	-	0	-/-
<i>Cercocarpus montanus</i>												
86	233	33	33	200	-	-	29	0	0	-	0	83/29
94	100	-	-	100	-	-	40	0	0	-	0	59/78
00	100	-	-	100	-	-	20	60	0	-	0	56/65
05	80	20	-	-	80	-	0	100	100	-	0	42/48
<i>Chrysanthamnus nauseosus hololeucus</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
94	100	-	-	100	-	-	0	0	0	-	0	21/21
00	140	100	20	60	60	-	14	57	43	29	29	24/12
05	80	-	-	40	40	20	0	100	50	50	50	16/21
<i>Ephedra viridis</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
94	180	-	100	80	-	-	0	0	0	-	0	24/30
00	160	-	20	100	40	-	13	75	25	-	13	31/35
05	320	-	20	260	40	-	13	0	13	-	0	31/40
<i>Gutierrezia sarothrae</i>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
94	760	40	20	740	-	-	0	0	0	-	0	8/8
00	9380	120	860	8180	340	180	0	0	4	1	1	6/5
05	520	80	480	20	20	80	0	4	4	4	4	3/5

		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Juniperus osteosperma												
86	200	-	100	100	-	-	33	17	-	-	0	122/67
94	0	-	-	-	-	-	0	0	-	-	0	-/-
00	260	-	180	80	-	20	0	0	-	-	0	-/-
05	400	-	220	180	-	80	0	0	-	-	0	-/-
Opuntia sp.												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
94	140	-	-	120	20	-	0	0	14	-	0	3/13
00	180	20	40	100	40	-	0	0	22	22	22	4/14
05	80	-	-	80	-	20	0	0	0	-	0	3/12
Pinus edulis												
86	166	-	66	100	-	-	0	0	-	-	0	59/48
94	0	-	-	-	-	-	0	0	-	-	0	-/-
00	180	-	20	160	-	-	0	0	-	-	0	-/-
05	140	-	-	140	-	-	0	0	-	-	14	-/-
Purshia tridentata												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
94	60	-	-	60	-	-	67	0	-	-	0	6/12
00	20	-	20	-	-	-	0	0	-	-	0	33/72
05	0	-	-	-	-	-	0	0	-	-	0	-/-